Ministry of Health

RECOMMENDATIONS FOR PREVENTION OF HIV TRANSMISSION IN HEALTH-CARE SETTINGS IN THE PROVINCE OF BRITISH COLUMBIA

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RECOMMENDATIONS FOR PREVENTION OF HIV TRANSMISSION IN HEALTH-CARE SETTINGS IN THE PROVINCE OF BRITISH COLUMBIA

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PREFACE

This manual contains recommendations and suggestions for the management of issues related to the acquired immunodeficiency syndrome (AIDS) that may arise in the hospital setting in British Columbia. The B.C. Provincial Advisory Committee on AIDS (PAC-AIDS) was asked to undertake this project and recruited a number of additional experts whose work is acknowledged in the report. Our understanding of the epidemiology and management of this viral infection is still evolving, however, the information in this manual represents the current consensus of opinion on the issues presented.

This manual is designed to assist the health-care community to optimize patient care and effectively deal with questions that might arise with regard to staff conduct and safety. A large portion of this manual was taken directly from the August 21, 1987, Centre for Disease Control (CDC) MMWR supplement: Recommendations for Prevention of HIV Transmission in Health-Care Settings. Additional material was taken from other publications of the CDC, the Canadian National Advisory Committee on AIDS (NAC-AIDS), the Federal Centre for AIDS (Canada) and the Wisconsin Department of Health and Social Services.

PAC-AIDS will endeavour to keep the contents of this manual updated on a periodic basis. Any comments, contributions or questions should be addressed to:

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I wish to thank all of my co-contributors for their generous assistance on this project.

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Editor

INTRODUCTION

Human immunodeficiency virus (HIV), the virus that causes acquired immunodeficiency syndrome (AIDS), is transmitted through sexual contact, exposure to infected blood or blood components and perinatally from mother to neonate. HIV has been isolated from blood, semen, vaginal secretions, saliva, tears, breast milk, cerebrospinal fluid, amniotic fluid, and urine and is likely to be isolated from other body fluids, secretions, and excretions. However, epidemiologic evidence has implicated only blood, semen, vaginal secretions, and breast milk in transmission.

The increasing prevalence of HIV increases the risk that health-care workers will be exposed to blood from patients infected with HIV, especially when blood and body-fluid precautions are not followed for all patients. This document emphasizes the need for health-care workers to consider all patients as potentially infected with HIV and/or other bloodborne pathogens and to adhere rigorously to infection control precautions for minimizing the risk of exposure to blood and body fluids of all patients.

DEFINITION OF HEALTH-CARE WORKERS

Health-care workers are defined as persons, including students and trainees, whose activities involve contact with patients or with blood or other body fluids from patients in a health-care setting.

PRECAUTIONS TO PREVENT TRANSMISSION OF HIV

Universal Precautions

Since medical history and examination cannot reliably identify all patients infected with HIV or other bloodborne pathogens, blood and body-fluid precautions should be consistently used for all patients. This approach, recommended by the Health Protection Branch, Health and Welfare Canada, and the Centre for Disease Control (CDC), Atlanta, referred to as "universal blood and body-fluid precautions" or "universal precautions", should be used in the care of all patients, especially those in emergency-care settings in which the risk of blood exposure is increased and the infection status of the patient is usually unknown. Universal precautions are intended to prevent parenteral, mucous membrane, and non-intact skin exposures of health-care workers to bloodborne pathogens.

The substances to which universal precautions apply include blood and other body fluids containing visible blood. Blood is the single most important source of HIV, hepatitis B virus (HBV), and other bloodborne pathogens in the occupational setting. The precautions also apply to semen and vaginal secretions although they have not been implicated in occupational transmission from patient to health-care worker. Universal precautions also apply to tissue and the following fluids: cerebrospinal fluid (CSF), synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid and amniotic fluid. The risk of transmission of HIV and HBV from these fluids is currently unknown, however. Universal precautions do not apply to feces, nasal secretions, sputum, sweat, tears, urine, and vomitus unless they contain visible blood. Some of these fluids and excretions represent a potential source of nosocomial and community-acquired infection with other pathogens and recommendations for preventing the transmission of non-bloodborne pathogens should be followed (8).

Human breast milk has been implicated in perinatal transmission of HIV, and HBsAg has been found in the milk of mothers infected with HBV. However, occupational exposure to human breast milk has not been implicated in the transmission of HIV nor HBV infection to health-care workers. Moreover, the health-care worker will not have the same type of intensive exposure to breast milk as the nursing neonate. Whereas universal precautions do not apply to human breast milk, gloves may be worn by health-care workers in situations where exposures to breast milk might be frequent, for example, in breast milk banking (3).

Universal precautions do not apply to saliva. General infection control practices already in existence - including the use of gloves for digital examination of mucous membranes and endotracheal suctioning, and handwashing after exposure to saliva - should further minimize the minute risk, if any, for salivary transmission of HIV and HBV. Gloves need not be worn when feeding patients and when wiping saliva from skin (3).

Special precautions, however, are recommended for dentistry (see Dental Care in HIV Infection, page 27.)

SPECIFIC RECOMMENDATIONS:

1. Barrier Precautions

All health-care workers should routinely use appropriate barrier precautions to prevent skin and mucous membrane exposure when contact with blood or other body fluids of any patient is anticipated. Gloves should be worn for touching blood and body fluids, mucous membranes, or non-intact skin of all patients, for handling items or surfaces soiled with blood or body fluids, and for performing venipuncture and other vascular access procedures. Gloves should be changed after contact with each patient; washing gloves is not acceptable. Masks and protective eyewear or face shields should be worn during procedures that are likely to generate droplets of blood or other body fluids to prevent exposure of mucous membranes of the mouth, nose, and eyes. Gowns or aprons should be worn during procedures that are likely to generate splashes of blood or other body fluids.

2. Phlebotomy

Glove use should reduce the incidence of blood contamination of hands when drawing blood samples (phlebotomy), but they cannot prevent penetrating injuries. Some institutions have relaxed recommendations for using gloves when phlebotomies are done by skilled personnel in settings where the prevalence of bloodborne pathogens is known to be very low. Institutions that judge that routine gloving for all phlebotomies is not necessary should periodically reevaluate their policy. Gloves should always be available to health-care workers who wish to use them for phlebotomy. In addition, the following general guidelines apply:

(a) Use gloves for performing phlebotomy when the health-care worker has cuts, scratches, or other breaks in his/her skin.

(b) Use gloves in situations where the health-care worker judges that hand contamination with blood may occur, for example, when performing phlebotomy on an uncooperative patient.

(c) Use gloves for performing finger and/or heel sticks on infants and children.

(d) Use gloves when persons are receiving training in phlebotomy.

3. Hand Washing

Hands and other skin surfaces should be washed immediately and thoroughly if contaminated with blood or other body fluids. Hands should be washed immediately after gloves are removed.

4. **Needles and Sharp Items**

   All health-care workers should take precautions to prevent injuries caused by needles, scalpels, and other sharp instruments or devices during procedures, when cleaning used instruments, during disposal of used needles, and when handling sharp instruments after procedures. To prevent needlestick injuries, needles should not be recapped, purposely bent or broken by hand, removed from disposable syringes, or otherwise manipulated by hand. After they are used, disposable syringes and needles, scalpel blades, and other sharp items should be placed in puncture-resistant containers for disposal; the puncture-resistant containers should be located as close as practical to the use area. Large-bore reusable needles should be placed in a puncture-resistant container for transport to the reprocessing area.

5. **C.P.R.**

   Although saliva has not been implicated in HIV transmission, to minimize the need for emergency mouth-to-mouth resuscitation, mouthpieces, resuscitation bags, or other ventilation devices should be available for use in areas in which the need for resuscitation is predictable.

6. **Exudative Skin Lesions**

   Health-care workers who have exudative lesions or weeping dermatitis should refrain from all direct patient care and from handling patient-care equipment until the condition resolves.

7. **Pregnant Health-Care Workers**

   Pregnant health-care workers are not known to be at greater risk of contracting HIV infection than health-care workers who are not pregnant; however, if a health-care worker develops HIV infection during pregnancy, the infant is at risk of infection resulting from perinatal transmission. Because of this risk, pregnant health-care workers should be especially familiar with and strictly adhere to precautions to minimize the risk of HIV transmission.

8. **Selection of Gloves**

   Medical gloves include those marketed as sterile surgical or nonsterile examination gloves made of vinyl or latex. General purpose utility ("rubber") gloves are also used in the health-care setting. There are no reported differences in barrier effectiveness between intact latex and intact vinyl used to manufacture gloves. Thus, the type of gloves selected should be appropriate for the task being performed.

   The following general guidelines are recommended:

   (a) Use sterile gloves for procedures involving contact with normally sterile areas of the body.

   (b) Use examination gloves for procedures involving contact with mucous membranes, unless otherwise indicated, and for other patient care of diagnostic procedures that do not require the use of sterile gloves.

(c) Change gloves between patient contacts.

(d) Do not wash or disinfect surgical or examination gloves for reuse. Washing with surfactants may cause "wicking", i.e., the enhanced penetration of liquids through undetected holes in the glove. Disinfecting agents may cause deterioration.

(e) Use general purpose utility gloves (e.g., rubber household gloves) for housekeeping chores involving potential blood contact and for instrument cleaning and decontamination procedures. Utility gloves may be decontaminated and reused but should be discarded if they are peeling, cracked, or discolored, or if they have punctures, tears, or other evidence of deterioration. When general purpose utility gloves are disinfected with phenolic compounds they may become permeable to fluids without showing signs of deterioration.

Implementation of universal blood and body-fluid precautions for all patients eliminates the need for use of the isolation category of "Blood and Body Fluid Precautions" previously recommended for patients known or suspected to be infected with bloodborne pathogens (8,18). Isolation precautions (e.g., enteric, "AFB") should be used as necessary if associated conditions, such as infectious diarrhea or tuberculosis, are diagnosed or suspected (8,18).

Precautions for Invasive Procedures

An invasive procedure is defined as surgical entry into tissues, cavities, or organs or repair of major traumatic injuries 1) in an operating or delivery room, emergency department, or outpatient setting, including both physicians' and dentists' offices; 2) cardiac catheterization and angiographic procedures; 3) a vaginal or cesarean delivery or other invasive obstetric procedure during which bleeding may occur; or 4) the manipulation, cutting, or removal of any oral or perioral tissues, including tooth structure, during which bleeding occurs or the potential for bleeding exists. The universal blood and body-fluid precautions listed above, combined with the precautions listed below, should be the minimum precautions for all such invasive procedures.

1. All health-care workers who participate in invasive procedures must routinely use appropriate barrier precautions to prevent skin and mucous-membrane contact with blood and other body fluids of all patients. Gloves and surgical masks must be worn for all invasive procedures. Protective eyewear or face shields should be worn for procedures that commonly result in the generation of droplets, splashing of body fluids, or the generation of bone chips. Gowns or aprons made of materials that provide an effective barrier should be worn during invasive procedures that are likely to result in the splashing of blood or other body fluids. All health-care workers who

perform or assist in vaginal or cesarean deliveries should wear gloves and gowns when handling the placenta or the infant until blood and amniotic fluid have been removed from the infant's skin and should wear gloves during post-delivery care of the umbilical cord.

2. If a glove is torn or a needlestick or other injury occurs, the glove should be removed, the area should be washed with water, soap or disinfectant and a new glove used as promptly as patient safety permits; the needle or instrument involved in the incident should also be removed from the sterile field.

Precautions for Bronchoscopies and Other Respiratory Procedures*

Parenteral exposure to a needle or other sharp instrument contaminated with blood presents the greatest potential risk. There is no evidence of aerosol transmission of HIV and the possible risks of aerosols are probably negligible. There is no evidence of ingestion as a mode of transmission of the virus.

Universal precautions should always be followed in addition to the specific recommendations below.

EQUIPMENT AND PERSONNEL

Pulmonary laboratory: Many centres with a high load of persons infected with HIV have dedicated laboratory equipment. If dedicated equipment is not available, it is recommended that potentially infectious persons are tested at the end of the working day.

- Tubing and mouthpieces should be disposed of or cleaned and immersed in:

  70% ethanol for one hour; or

  70% isopropanol for one hour; or

  2% glutaraldehyde if freshly prepared or

  1% glutaraldehyde if stabilized for one hour.

  All these solutions are effective against HIV.

- Spirometers of the vitalograph type (no inspiration from spirometer) are preferred.
- Flushing of regular spirometers with room air can greatly reduce possibilities of transmission from the spirometer.
- For DLCO apparatus, a virus filter trap (PELL) should be used on line.
- If patients have persistent cough, technicians should wear a mask.

**Adapted with changes from the recommended guidelines of the Canadian Thoracic Society - 1987.*

BRONCHOSCOPY

- Bronchoscopies are better done in the patients' rooms or in specially dedicated bronchoscopy suites.
- Work surfaces should be disinfected with sodium hypochlorite solution (0.5% final concentration) following any spill of potentially infectious material (and at the completion of work).
- Protective clothing such as gowns, masks, and eye-coverings should be used when there is a possibility of splattering with blood, secretions, excretions, or other body fluids.
- Gloves should be worn.
- All blood/body fluid specimens should be placed in a second container, such as a leak-proof bag, for transport. Accompanying requisitions should be attached to the outside of the leak-proof bag.
- The equipment should be thoroughly cleaned as usual and then gas-sterilized.
- If gas-sterilization is not available, bronchoscopes should be treated in the same way as spirometry tubes (see above). Bronchoscopes should preferably be immersed in the disinfectant solution.
- Biopsy equipment can simply be immersed in disinfectant solution after cleaning. (see above).

RESPIRATORS

Tubing should be disposed of or cleaned and disinfected with any of the solutions mentioned above, or gas-sterilized. Virus filter traps (PELL) should be used in the inspiratory and expiratory lines.

Precautions for Dialysis

Patients with end-stage renal disease who are undergoing maintenance dialysis and who have HIV infection can be dialyzed in hospital-based or free-standing dialysis units using conventional infection-control precautions. Universal blood and body-fluid precautions should be used when dialyzing all patients.

Strategies for disinfecting the dialysis fluid pathways of the hemodialysis machine are targeted to control bacterial contamination and generally consist of using 500-750 parts per million (ppm) of sodium hypochlorite (household bleach) for 30-40 minutes or 1.5%-2.0% formaldehyde overnight. In addition, several chemical germicides formulated to disinfect dialysis machines are commercially available. None of these protocols or procedures need to be changed for dialyzing patients infected with HIV.

Patients infected with HIV can be dialyzed by either hemodialysis or peritoneal dialysis and do not need to be isolated from other patients. The type of dialysis treatment (i.e., hemodialysis or peritoneal dialysis) should be based on the need of the patient. The dialyzer may be discarded after each use. Alternatively, centers that reuse dialyzers, i.e., a specific single-use dialyzer is issued to a specific patient, removed, cleaned, disinfected, and reused several times on the same patient only - may include HIV-infected patients in the dialyzer-reuse program. An individual dialyzer must never be used on more than one patient.

Precautions for Laboratories

Blood and other fluids from all patients should be considered infective. To supplement the universal blood and body-fluid precautions listed previously, the following precautions are recommended for health-care workers in clinical laboratories.

1. All specimens of blood and body fluids should be put in a well constructed container with a secure lid to prevent leaking during transport. Care should be taken when collecting each specimen to avoid contaminating the outside of the container and of the laboratory form accompanying the specimen.
2. All persons performing phlebotomies and processing blood and body-fluid specimens (e.g., removing tops from vacuum tubes) should wear gloves. Masks and protective eyewear should be worn if mucous-membrane contact with blood or body fluids is anticipated. Gloves should be changed and hands washed after completion of specimen processing.
3. For routine procedures, such as histologic and pathologic studies or microbiologic culturing, a biological safety cabinet is not necessary. However, biological safety cabinets (Class I or II) should be used whenever procedures are conducted that have a high potential for generating droplets. These include activities such as blending, sonicating, and vigorous mixing.
4. Mechanical pipetting devices should be used for manipulating all liquids in the laboratory. Mouth pipetting must not be done.
5. Use of needles and syringes should be limited to situations in which there is no alternative, and the recommendations for preventing injuries with needles outlined under universal precautions should be followed.

6. Laboratory work surfaces should be decontaminated with an appropriate chemical germicide after a spill of blood or other body fluids and when work activities are completed.

7. Contaminated materials used in laboratory tests should be decontaminated before reprocessing or be placed in bags and disposed of in accordance with institutional policies for disposal of infective waste.

8. Scientific equipment that has been contaminated with blood or other body fluids should be decontaminated and cleaned before being repaired in the laboratory or transported to the manufacturer.

9. All persons should wash their hands after completing laboratory activities and should remove protective clothing before leaving the laboratory.

10. In addition to universal blood and body fluid precautions, specific precautions for persons performing postmortem procedures include:

    (a) All persons performing or assisting in postmortem procedures should wear gloves, masks, protective eyewear, gowns, and waterproof aprons; and

    (b) Instruments and surfaces contaminated during postmortem procedures should be decontaminated with an appropriate chemical germicide.

11. All blood and blood products transfused in the province should be obtained from donors tested to be HIV antibody negative.

Implementation of universal blood and body-fluid precautions for all patients eliminates the need for warning labels on specimens, requisitions, and bodies since blood and other body fluids from all patients should be considered infective.

NOTE:

Persons providing mortuary services in British Columbia (e.g. funeral directors) have only recently begun to consider the need for universal precautions in their work. Until the implementation of universal precautions is completed in this industry in B.C., it is recommended that the bodies of persons known to be infected with HIV, HBV or other bloodborne pathogens be tagged as an 'infective hazard' before leaving the hospital. When the implementation of universal precautions in mortuary services has been completed, the B.C. Provincial Advisory Committee on AIDS will notify hospitals that body tagging can cease.

Implementation of Universal Precautions

Universal precautions shift the emphasis of isolation from patients themselves to potentially contagious body fluids. This will be a new and difficult concept for many hospitals and health-care workers. There is little doubt, however, that consistent and properly implemented universal precautions will provide the maximum protection for health-care workers and the maximum confidentiality for patients.

To provide for the smoothest transition to universal precautions, the following stepwise implementation plan may be considered.

A. PRIOR TO IMPLEMENTATION

1. The institution must determine what universal precautions means in specifics. Currently broad guidelines are available and each institution must translate them into specific behaviour i.e. procedures developed which can be implemented and monitored.
2. Consult with relevant hospital committees (e.g. AIDS committees, occupational health committees);
3. Discuss the concept and implementation with the health-care workers' organizations involved (e.g. unions);
4. Arrange for the education and training of all health-care workers - including students and trainees - on the epidemiology, modes of transmission, and prevention of HIV and other bloodborne infections and the need for routine use of universal blood and body-fluid precautions for all patients;
5. Assess the pre-implementation usage of supplies and equipment and determine the need for additional stock; and
6. Determine the means of monitoring compliance.

B. DURING IMPLEMENTATION

It may be helpful during the initial implementation period to initiate full universal precautions and at the same time continue the current method of isolation for patients known or suspected to be infected with bloodborne pathogens. This will usually involve continuing to mark specimens, requisitions, charts, beds, etc. with "Blood and Body Fluid Precautions" labels. A specific date must be set for the discontinuance of this previous system of precautions and isolation - e.g. 12 months.

This initial period of implementation while the two systems are running in parallel will allow health-care workers to become familiar with universal precautions and the administration to monitor the acceptance of universal precautions, the adherence to universal precautions, and the financial impact. When monitoring reveals a failure to follow recommended precautions, counselling, education, and/or re-training should be provided. Signs reminding workers of universal precautions should be posted in key areas.

An alternate approach chosen by some institutions is to implement the aspects of universal precautions in a stepwise fashion. For instance, gloves, and other barriers are made available, and training as to their proper usage within universal precautions is done as an initial step. Once again, however, the full implementation should proceed and be completed on a rigid timetable.

C. AFTER IMPLEMENTATION

Once universal precautions are fully implemented and the previous system of precautions has been abandoned, employers of health-care workers should ensure that policies exist for:

1. Initial orientation of new workers and continuing education and training of all health-care workers - including students and trainees - on the epidemiology, modes of transmission, and prevention of HIV and other bloodborne infections and the need for routine use of universal blood and body-fluid precautions for all patients.
2. Provision of equipment and supplies necessary to minimize the risk of infection with HIV and other bloodborne pathogens.
3. Monitoring adherence to recommended protective measures.
4. Monitoring the financial impact.

Professional associations and labour organizations, through continuing education efforts, should emphasize the need for health-care workers to follow recommended precautions.

Labelling in Addition to Universal Precautions

The consistent and correct application of universal precautions in the health-care setting will provide the maximum level of protection for health-care workers and the maximum level of confidentiality for patients. Anything which hinders the proper implementation of such precautions will compromise their effectiveness.

Certain individuals, hospitals, and organizations have advocated the continued labelling of various items that are associated with known or suspected infective blood or body fluids. It is argued that the 'special' care used with such labelled items will provide additional protection to health-care workers.

The arguments against the labelling of suspect items together with the use of universal precautions are:

1. There is nothing additional to universal precautions that will protect health-care workers when dealing with labelled items;
2. The concept of labelled (i.e. more infectious) items and non-labelled (i.e. less infectious) items is contrary to the basic logic of universal precautions and will hinder their proper and consistent usage;

3. Confidential patient information will be available to a wider circle of persons with no offsetting gain in safety;
4. Labelling systems themselves have been shown to be inaccurate and ineffective (29,30); and
5. HIV labelling does not prevent accidental exposure (33).

In summary, the full implementation of universal precautions is recommended. Concurrent labelling (e.g. specimens, requisitions, bodies, beds, rooms, the outside of charts, etc.) is not recommended. Requisitions themselves should not ask for information on the presence of HIV, HBV, or other bloodborne pathogens unless this will affect the test itself or its interpretation. The only place where this type of information should be recorded is in the patient's confidential medical records. It is necessary in the records for diagnostic and therapeutic reasons rather than staff protection. Only during the initial, time-limited implementation period might labelling in addition to universal precautions make sense (see previous section on Implemention of Universal Precautions).

ENVIRONMENTAL CONSIDERATIONS FOR HIV TRANSMISSION

No environmentally mediated mode of HIV transmission has been documented. Nevertheless, the precautions described below should be taken routinely in the care of all patients.

Sterilization and Disinfection

Standard sterilization and disinfection procedures for patient-care equipment currently recommended for use in a variety of health-care settings (including hospitals, medical and dental clinics and offices, hemodialysis centers, emergency-care facilities, and long-term nursing-care facilities) are adequate to sterilize or disinfect instruments, devices, or other items contaminated with blood or other body fluids from persons infected with bloodborne pathogens including HIV (27,28).

Instruments or devices that enter sterile tissue or the vascular system of any patient or through which blood flows should be sterilized before reuse. Devices or items that contact intact mucous membranes should be sterilized or receive high-level disinfection, a procedure that kills vegetative organisms and viruses but not necessarily large numbers of bacterial spores.

Contact lenses used in trial fittings should be disinfected after each fitting by using a hydrogen peroxide contact lens disinfecting system, or if compatible, with heat (78 C-80 C) [172.4 F-176.0 F] for ten minutes.

Medical devices or instruments that require sterilization or disinfection should be thoroughly cleaned before being exposed to the germicide, and the manufacturer's instructions for the use of the germicide should be followed. Further, it is important that the manufacturer's specifications for compatibility of the medical device with chemical germicides be closely followed.

Studies have shown that HIV is inactivated rapidly after being exposed to commonly used chemical germicides at concentrations that are much lower than used in practice (14). Embalming fluids are similar to the types of chemical germicides that have been tested and found to completely inactivate HIV. In addition to commercially available chemical germicides, a solution of sodium hypochlorite (household bleach) prepared daily is an inexpensive and effective germicide. Concentrations ranging from approximately 500 ppm (1:100 dilution of household bleach) sodium hypochlorite to 5,000 ppm (1:10 dilution of household bleach) are effective depending on the amount of organic material (e.g., blood, mucous) present on the surface to be cleaned and disinfected. Commercially available chemical germicides may be more compatible with certain medical devices that might be corroded by repeated exposure to sodium hypochlorite, especially to the 1:10 dilution.

Housekeeping

Environmental surfaces such as walls, floors, and other surfaces are not associated with transmission of infections to patients or health-care workers. Therefore, extraordinary attempts to disinfect or sterilize these environmental surfaces are not necessary. However, cleaning and removal of soil should be done routinely.

Cleaning schedules and methods vary according to the area of the hospital or institution, type of surface to be cleaned, and the amount and type of soiling present. Horizontal surfaces (e.g., bedside tables and hard-surfaced flooring) in patient-care areas are usually cleaned on a regular basis, when soiling or spills occur, and when a patient is discharged. Cleaning of walls, blinds and curtains is recommended only if they are visibly soiled. Disinfectant fogging is an unsatisfactory method of decontaminating air and surfaces and is not recommended.

Disinfectant-detergent formulations registered by the EPA can be used for cleaning environmental surfaces, but the actual physical removal of microorganisms by scrubbing is probably at least as important as any antimicrobial effect of the cleaning agent used. Therefore, cost, safety, and acceptability by housekeepers can be the main criteria for selecting any such registered agent. The manufacturers' instructions for appropriate use should be followed.

Cleaning and Decontaminating Spills of Blood or Other Body Fluids

Chemical germicides that are approved for use as "hospital disinfectants" and are tuberculocidal when used at recommended dilutions can be used to decontaminate spills of blood and other body fluids. Strategies for decontaminating spills of blood and other body fluids in a patient-care setting are different than for spills of cultures or other materials in clinical, public health, or research laboratories. In patient-care areas, visible material should first be removed and then the area should be decontaminated. With large spills of cultured or concentrated infectious agents in the laboratory, the contaminated area should be flooded with a liquid germicide before cleaning, then decomtaminated with fresh germicidal chemical. In both settings, gloves should be worn during the cleaning and decontaminating procedures.

Laundry

Although soiled linen has been identified as a source of large numbers of certain pathogenic microorganisms, the risk of actual disease transmission is negligible. Rather than rigid procedures and specifications, hygiene and common sense storage and processing of clean and soiled linen are recommended (27). Soiled linen should be handled as little as possible and with minimum agitation to prevent gross microbial

contamination of the air and of persons handling the linen. All soiled linen should be bagged at the location where it was used; it should not be sorted or rinsed in patient-care areas. Linen soiled with blood or body fluids should be placed and transported in bags that prevent leakage. If hot water is used, linen should be washed with detergent in water at least 71 C (160 F) for twenty-five (25) minutes. If low-temperature (70 C [158 F]) laundry cycles are used, chemicals suitable for low-temperature washing at proper use concentration should be used.

Infective Waste

There is no epidemiologic evidence to suggest that most hospital waste is more infective than residential waste. Moreover, there is no epidemiologic evidence that hospital waste has caused disease in the community as a result of improper disposal. Therefore, identifying wastes for which special precautions are indicated is largely a matter of judgment about the relative risk of disease transmission.

The most practical approach to the management of infective waste is to identify those wastes with the potential for causing infection during handling and disposal and for which some special precautions appear prudent. Hospital wastes for which special precautions appear prudent include microbiology laboratory waste, pathology waste, and blood specimens or blood products. While any item that has had contact with blood, exudates, or secretions may be potentially infective, it is not usually considered practical or necessary to treat all such waste as infective. Infective waste, in general, should either be incinerated or should be autoclaved before disposal in a sanitary landfill.

Bulk blood, suctioned fluids, excretions, and secretions may be carefully poured down a drain connected to a sanitary sewer. Sanitary sewers may also be used to dispose of other infectious wastes capable of being ground and flushed into the sewer.

HOSPITAL ADMINISTRATIVE ISSUES

Hospital policies must reflect the institution's primary objective, i.e., patient care, and the employer's concern for the employees providing services.

Refusal to Provide Care to Specific Patients

The nature of the work involved with care of the sick carries with it a degree of risk which requires that all health-care workers apply appropriate protective measures at all times. At this time there is no evidence that the risks associated with providing hands-on care to persons infected with human immunodeficiency virus (HIV) are significantly greater than the risks associated with caring for other sick persons.

Physicians and other health-care providers, having decided to function in their disciplines, have accepted an ethical and moral responsibility to provide care to all patients to the best of their abilities. In the absence of scientific reasons not to provide care, and providing appropriate infection control precautions are observed, care should not be denied to patients with AIDS.

Physicians who are not employees of the hospital may not be subject to its administrative rules governing provision of care. However, they have an ethical obligation to provide the same standards of professional care to all patients independent of the nature of the individual illness. Cases in which physicians refuse to provide care should be brought to the attention of the hospital administration.

If staff refuse to work with HIV-infected patients, the issue should be discussed on an individual basis with the immediate superiors and a decision be made on the merits of that particular case. Health-care workers who are immunocompromised or pregnant may well require alternate employment. In most hospitals, improved staff education decreases these types of transfer requests and refusals to care for AIDS patients.

Management of Infected Health-Care Workers

Health-care workers with impaired immune systems resulting from HIV infection or other causes are at increased risk of acquiring or experiencing serious complications of infectious diseases. Of particular concern is the risk of severe infection following exposure to patients with infectious diseases that are easily transmitted if appropriate precautions are not taken (e.g., measles, varicella). Any health-care worker with an impaired immune system should be counselled about the potential risk associated with taking care of patients with any transmissible infection and should continue to follow existing recommendations for infection control to minimize risk of exposure to other infectious agents. Recommendations of the Immunization Practices Advisory Committee (ACIP) and institutional policies concerning requirements for vaccinating health-care workers with live-virus vaccines (e.g., measles, rubella) should be reviewed.

Generally the staff member should continue in his/her work assignment taking precautions as contained in the infection control procedures of the institution. Changes in work assignments should be determined on an individual basis.

Management of Exposures

If a health-care worker has a parenteral (e.g., needlestick or cut) or mucous-membrane (e.g., splash to the eye or mouth) exposure to blood or other body fluids or has a cutaneous exposure involving large amounts of blood or prolonged contact with blood - especially when the exposed skin is chapped, abraded, or afflicted with dermatitis - the source patient should be informed of the incident and tested for serologic evidence of HIV infection after consent is obtained. Policies should be developed for testing source patients in situations in which consent cannot be obtained (e.g., an unconscious patient).

If the source patient has AIDS, is positive for HIV antibody, or refuses the test, the health-care worker should be counselled regarding the risk of infection and evaluated clinically and serologically for evidence of HIV infection as soon as possible after the exposure. The health-care worker should be advised to report and seek medical evaluation for any acute febrile illness that occurs within twelve (12) weeks after the exposure. Such an illness - particularly one characterized by fever, rash, or lymphadenopathy - may be indicative of recent HIV infection.

Seronegative health-care workers should be retested six weeks post-exposure and on a periodic basis thereafter (e.g., twelve weeks and six months after exposure) to determine whether transmission has occurred. During this follow-up period - especially the first six - twelve weeks after exposure, when most infected persons are expected to seroconvert - exposed health-care workers should follow U.S. Public Health Service (PHS) recommendations for preventing transmission of HIV (see Reference 26).

No further follow-up of a health-care worker exposed to infection as described above is necessary if the source patient is seronegative unless the source patient is at high risk of HIV infection. In the latter case, a subsequent specimen (e.g., twelve weeks following exposure) may be obtained from the health-care worker for antibody testing. If the source patient cannot be identified, decisions regarding appropriate follow-up should be individualized. Serologic testing should be available to all health-care workers who are concerned that they may have been infected with HIV.

If a patient has a parenteral or mucous-membrane exposure to blood or other body fluid of a health-care worker, the patient should be informed of the incident, and the same procedure outlined above for management of exposures should be followed for both the source health-care worker and the exposed patient.

TESTING OF PATIENTS

Adherence to universal blood and body-fluid precautions in the care of all patients will minimize the risk of transmission of HIV and other bloodborne pathogens from patients to health-care workers. The utility of routine HIV serologic testing of patients as an adjunct to universal precautions is unknown. Results of such testing may not be available in emergency or outpatient settings. In addition, some recently infected patients will not have detectable antibody to HIV.

Personnel in some hospitals have advocated serologic testing of patients in settings in which exposure of health-care workers to large amounts of patients' blood may be anticipated. Specific patients for whom serologic testing has been advocated include those undergoing major operative procedures and those undergoing treatment in critical-care units, especially if they have conditions involving uncontrolled bleeding.

In addition to the universal precautions recommended for all patients, certain additional precautions for the care of HIV-infected patients undergoing major surgical operations have been proposed by personnel in some hospitals. For example, surgical procedures on an HIV-infected patient might be altered so that hand-to-hand passing of sharp instruments would be eliminated; stapling instruments rather than hand-suturing equipment might be used to perform tissue approximation; electrocautery devices rather than scalpels might be used as cutting instruments; and, even though uncomfortable, gowns that totally prevent seepage of blood onto the skin of members of the operative team might be worn. While such modifications might further minimize the risk of HIV infection for members of the operative team, some of these techniques could result in prolongation of operative time and could potentially have an adverse effect on the patient.

HIV testing in hospitals should be guided by the following principles:

1. There is insufficient justification at this time for routine screening of any group of hospital or surgical patients.
2. When HIV testing is necessary for diagnostic or therapeutic purposes, the patient's informed consent should be obtained unless the hospital administration has decided that this is unnecessary. Some hospitals have decided that the general consent obtained on admission is sufficient in such clinical situations.
3. If HIV testing which can be linked to the patient is done for non-diagnostic or research purposes a written consent or record of a verbal consent should be registered on the patient's chart. Such programs should be evaluated prospectively as to: a) their efficacy in reducing the incidence of parenteral, mucous-membrane or significant cutaneous exposures of health-care workers to the blood or other body fluids of HIV-infected patients, b) their effect on patients and staff, and c) the ethical implications.
4. Patients tested in the hospital should be informed of the test results and counselling must be provided for all positive patients by properly trained personnel.

5. If a patient refuses to be tested when it is recommended, this may be noted on their chart but this should not affect the standard of care.
6. Assurance should be in place that confidentiality safeguards will limit the knowledge of test results to those directly involved in the care of the patient.
7. Reinforcement should be made to all hospital staff (medical and non-medical) about their obligation to maintain confidentiality of all information on patients.
8. Infected patients should not be denied appropriate care. If a patient is known to be HIV infected prior to admission, this information should be conveyed in the medical history, as would any other relevant information regarding the patient. It is the responsibility of the primary physician to inform all those in the hospital who need to know the HIV status. This includes other involved physicians, nurses and the infection control officer of the hospital (the latter is recommended so that appropriate precautions can be taken in the event of a needle stick injury or laboratory accident).

TESTING OF HEALTH-CARE WORKERS

Although transmission of HIV from infected health-care workers to patients has not been reported, transmission during invasive procedures remains a possibility. Transmission of hepatitis B virus (HBV) - a bloodborne agent with a considerably greater potential for nosocomial spread - from health-care workers to patients has been documented. Such transmission has occurred in situations (e.g., oral and gynecologic surgery) in which health-care workers, when tested, had very high concentrations of HBV in their blood (at least 100 million infectious virus particles per millileter, a concentration much higher than occurs with HIV infection), and the health-care workers sustained a puncture wound while performing invasive procedures or had exudative or weeping lesions or microlacerations that allowed virus to contaminate instruments or open wounds of patients (31,32).

The hepatitis B experience indicates that only those health-care workers who perform certain types of invasive procedures have transmitted HBV to patients. Adherence to recommendations in this document will minimize the risk of transmission of HIV and other bloodborne pathogens from health-care workers to patients during invasive procedures. Since transmission of HIV from infected health-care workers performing invasive procedures to their patients has not been reported and would be expected to occur only very rarely, if at all, the utility of routine testing of such health-care workers to prevent transmission of HIV cannot be assessed. If consideration is given to developing a serologic testing program for health-care workers who perform invasive procedures, the frequency of testing, as well as the issues of consent, confidentiality, and consequences of test results - as previously outlined for testing programs for patients - must be addressed.

CHILDREN WITH ACQUIRED IMMUNO-DEFICIENCY SYNDROME (AIDS)

Pediatric Groups at Risk for HIV Infection Include:

- Recipients of blood and blood products, infants born to infected mothers, and people from countries where the disease is endemic.

AIDS IN PEDIATRICS

1. **Epidemiology**

   Pediatric cases constitute approximately 1% of the cases reported in the United States and 1 to 2% in Canada. Increases in HIV infection in females will likely result in increased pediatric cases.

2. **Transmission**

   Transplacental transmission of HIV may occur or the infant may be contaminated by infectious cervico-vaginal secretions or blood during birth. HIV has been detected in breast milk and this may be a route of transmission. HIV may also be transmitted by transfusion of blood or blood products.

3. **Diagnosis**

   Twenty-five to fifty percent of babies born to infected mothers will be infected. Furthermore, the risk to the baby increases as the maternal disease progresses. However, a definite diagnosis of HIV infection in perinatally-exposed infants and children under fifteen (15) months of age can be difficult. Passively transferred maternal HIV antibodies may persist for up to fifteen (15) months. The infection status of HIV-seropositive infants and children who are asymptomatic and without immune abnormalities cannot be determined unless virus culture or other viral detection tests are positive. At present, a negative virus culture does not mean that the child is not infected, since the sensitivity of the culture may be low.

4. **Clinical Findings**

   A significant number of infected babies will become symptomatic by six to twelve (12) months of age. Problems include weight loss, diarrhea, thrush, pneumocystis pneumonia, and/or developmental delay (the virus does infect cells of the CNS). Children tend to have lymphocytic interstitial pneumonitis (LIP), a diagnosis very uncommon in adult AIDS patients. Children with significant opportunistic infections die young (within eighteen [18] months) but survival to eight to ten (10) years of age does occur in the absence of early opportunistic infection. Mortality rates eventually approach 100% however.

5. **Laboratory Findings**

   The majority of laboratory findings are similar to those of the adult patient. However, lymphopenia is less common and immunoglobulin levels tend to be higher (especially in association with LIP). Children will produce HIV antibody, but care must be taken regarding the diagnosis at a younger age when passively acquired maternal antibody will be present.

6. Therapy

There is no curative therapy for childhood (or adult) AIDS. Currently, Azidothymidine (AZT) is being successfully used to temporarily improve the immune system and ameliorate symptoms.

CARE OF THE NEWBORN INFANT

Universal blood and body-fluid precautions (as discussed previously) apply to newborn infants as well. If the mother is known or highly suspected to be HIV infected, this should be noted on the infant's chart. All infants should be washed free of all blood as soon as possible. The AIDS virus has been isolated from breast milk and mothers with HIV should be advised not to breastfeed their infants to avoid postnatal transmission.

MANAGEMENT OF PEDIATRIC AIDS PATIENTS IN AMBULATORY CARE

In general, segregation of the patient is not justified unless he/she has another contagious infection. However, consideration must be given to the age and behaviour of the patient and the clinic to be attended. Clearly, the HIV-positive patient is at risk for severe illnesses associated with the usual contagious infections in other patients.

THE PRE-HOSPITAL/ EMERGENCY MEDICAL CARE SETTING

RECOMMENDATIONS TO PREVENT HIV TRANSMISSION

1. **Universal Precautions**

   Universal blood and body-fluid precautions should be followed for all patients (see pages 3-6). Many of the recommendations which follow restate the principles already outlined in the previous sections on universal precautions.

2. **Medical Record**

   Any patient known to be infected with HIV should have this information recorded in the medical history but not on the outside of the chart or medical record.

3. **Labels**

   Implementation of universal blood and body-fluid precautions for all patients eliminates the need for use of the isolation category of "Blood and Body Fluid Precautions" for patients known or suspected to be infected with bloodborne pathogens. Labelling of items associated with patients who are known or suspected to be infected with HIV, HBV, or bloodborne pathogens should not be done. Isolation precautions (e.g. enteric, "AFB") should be used if associated conditions, such as infectious diarrhea or tuberculosis, are diagnosed or suspected.

4. **Specimens**

   If the outside of the specimen container is visibly contaminated with blood, it should be cleaned with a disinfectant, such as a freshly prepared (once daily) 1:10 dilution of 5.15% sodium hypochlorite (household bleach) with water. All blood and other specimens should be placed in a second container, such as an impervious bag, for transport. The container or bag should be examined carefully for leaks or cracks. Universal precautions eliminates the need for warnings of infectious hazard on specimens or requisitions.

5. **Wounds**

   Open wounds/lesions of all patients should be covered and contact with them avoided as much as possible.

6. **Masks**

   Wearing masks is not routinely necessary for emergency medical-care providers caring for patients with HIV infections. Masks should be worn whenever the patient has a productive or uncontrolled cough, suggesting a lower respiratory infection, or whenever the emergency medical care provider has an upper respiratory infection. Personal jump kits, first responder kits, and ambulance/rescue vehicles should contain an immediately available supply of masks.

7. **Protective Eye Wear**

   Goggles are recommended in situations in which splatters with blood, bloody secretions, or body fluids are possible. This is particularly recommended in the performance of procedures such as endotracheal intubation.

8. **Protective Clothing**

The use of additional protective clothing such as a disposable gown is recommended if soiling of clothing with blood or body fluids is anticipated.

9. **Gloves**

Disposable gloves should be worn by all persons who are in direct contact with blood, tissue, or body fluids or articles or surfaces potentially contaminated by blood or body fluids. The particular body fluids of concern are delineated in the previous section on universal precautions. This includes all instances when an emergency care provider performs a venipuncture or parenteral injection. This recommendation is especially important for personnel who have cuts or abrasions on their hands. Personal jump kits, first responder kits, and rescue/ambulance vehicles should contain an immediately available supply of nonsterile gloves.

Hands and any other skin or mucosal surface exposed to blood or body fluids must be washed as soon as possible after contact with a patient, and after removing protective clothing, mask, or gloves.

10. **Cardiopulmonary Resuscitation**

HIV has been rarely isolated from saliva of HIV-infected persons and it is found at far lower viral titres than in blood. Additional epidemiologic data indicate casual transmission of HIV does not occur, even among household members exposed to the saliva of infected persons. General infection control procedures suggest using ventilatory assist devices when possible and such devices may be of value in providing peace of mind to the user. However, in the event a device is not readily available it is inappropriate to delay or deny providing mouth-to-mouth resuscitation based on the fear that a patient may have AIDS or an HIV infection.

11. **Needles and Syringes**

Needles, syringes and other sharp instruments should be disposable where possible and should be disposed of in rigid, puncture-resistant containers. Needles should not be recapped and should not be purposely bent or broken by hand, since accidental needle puncture may occur. The use of needle cutting devices is not recommended.

12. **Instruments and Equipment**

Disposable equipment should be used whenever possible. Any reusable items that come in contact with blood, secretions, excretions, or tissue must be sterilized or disinfected before reuse. Used items should be bagged before being sent for decontamination and reprocessing. Autoclaving should be used for all reusable instruments and equipment that will tolerate heat sterilization. Ventilator tubing should be either disposable or sterilized before use. Ventilation masks should be cleaned and preferably sterilized between each use. If not sterilized, they should be washed with a germicidal/viricidal solution and air-dried before reassembly. All additional respiratory equipment and any other reusable equipment contaminated with blood or body fluids should be cleaned and disinfected with a 1:10 dilution of

household bleach or 70% isopropyl alcohol. Equipment not exposed to blood or body fluids need not be cleaned in this manner. Suction equipment should have disposable tubing and the bottles should have plastic liners which are replaced after each use. Bandages and other one-time-use items such as disposable gloves and any contaminated articles of clothing not intended to be reused should be placed in a plastic bag and labeled appropriately. All disposable items should be incinerated or disposed of in accordance with an accepted protocol for disposal of infectious wastes.

13. Exudative Skin Lesions

Emergency medical-care providers who have exudative lesions or weeping dermatitis should refrain from all direct patient care and from handling patient-care equipment until the condition resolves.

14. Reporting of Significant Exposure to Blood/Body Fluids; The Hospital's Responsibilities

Ambulance run record forms should include a section identifying the name(s) of any person(s) significantly exposed to blood or body fluids during the administration of emergency medical care and the type(s) of exposure that occurred. Hospitals should develop systems to notify those exposed if the patient is subsequently found to have a communicable disease.

DENTAL CARE IN HIV INFECTION

1. Oral Manifestations of HIV Infection

Individuals with HIV infection will require routine dental care. They may also have unique oral soft tissue infections and tumors that may require special training or expertise in their management. Oral manifestations may be the first clinical sign or symptom of HIV infection or may develop during the course of the disease.

(a) Infections may be severe and extended in duration and area of involvement. Candidiasis is the most common oral infection and is present in over half of the patients. Oral and oropharyngeal candidiasis may present as red lesions, red-white lesions, or white plaques and patches. The infection may be symptomatic resulting in oral burning and discomfort, dysphagia, and change in taste. The development of candidiasis during the disease may indicate progression of immunosuppression. Other opportunistic infections may develop caused by other fungal or bacterial organisms. Viral infections are commonly seen in immunosuppressed patients. Herpes simplex infection may be persistent for weeks or months and may present with extensive involvement. Varicella zoster infection may also be activated. Hairy leukoplakia has been described in immunosuppressed patients as a corrugated white lesion on the lateral borders of the tongue. This lesion is associated with Epstein-Barr virus infection. Squamous papillomas (viral warts) and condyloma acuminata (venereal warts) may be present intraorally.

(b) Premature progressive periodontal disease has been reported in HIV infection. The periodontal involvement may present as necrotizing, ulcerative gingivitis, premature bone loss with gingival recession, and/or painful, hemorrhagic gingivitis. Other oral manifestations may include xerostomia (dry mouth), recurrent vesiculo-erosive lesions, and aphthous-like stomatitis. Many of the mucosal lesions may represent reflections of immune-dysregulation resulting in unusual drug reactions.

(c) Tumors that occur in the oral cavity include Kaposi's sarcoma, squamous cell carcinoma, and lymphoma. Kaposi's sarcoma is generally asymptomatic unless the lesion becomes large and ulcerated. These lesions appear as blue-red discolorations that can become exophytic.

2. Infection Control in Dental Practice

Theoretically, HIV, which may be present in saliva or oral blood, could result in infection of the dental worker. This theoretical risk must be assessed and minimized. All patients must be treated as though they are capable of transmission of infection. The need for barrier precautions and other infection control recommendations should be presented in a positive manner to patients. Indeed, patients are beginning to demand that all health professionals take appropriate precautions.

(a) Universal Precautions

Universal blood and body-fluid precautions should be followed for all patients (see pages 3-6). Blood, saliva and gingival fluid from all dental patients should be considered infective. In addition to wearing gloves for contact with oral mucous membranes of all patients, all dental workers should wear surgical masks and protective eyewear or chin-length plastic face shields during dental procedures in which splashing or spattering of blood, saliva, or gingival fluids is likely.

(b) Instruments and Equipment

Critical instruments are those that penetrate mucosa or skin or contact tissue surfaces.

Semi-critical instruments are those that contact intact mucosal or skin surfaces, but do not penetrate epithelium.

Less critical instruments or surfaces are those that do not contact the patient.

Needles and scalpel blades that are disposable should be used as much as possible. Needles should not be recapped due to risk of injury. All disposable sharp instruments should be placed in puncture-resistant containers.

Reusable instruments must be cleaned and debrided to remove organic debris and reduce the biologic load and then sterilized. Ultrasonic cleaning with a disinfectant and surfactant may be useful as part of the precleaning of instruments. Household utility gloves should be worn while scrubbing instruments with disinfectant.

The steam autoclave and unsaturated chemical vapor are the methods of choice for sterilization. When these processes cannot be used due to instrument or material incompatibility, cold sterilization/disinfectant solutions are used.

Categories of accepted cold sterilization/disinfectant solutions must be used according to manufacturer's instructions.

Cleaning of Dental Handpieces - Any risk associated with retraction of water and fluids into the handpiece remains to be documented. However, it is prudent to install anti-retraction valves so that "suck back" does not occur. The handpiece should be run thirty (30) seconds before use and after use in a patient. Handpieces should be sterilized after use with each patient, preferably by autoclaving. If the handpiece is not sterilizable the surface should be cleansed with a disinfectant/sterilization solution. New handpieces when purchased should be sterilized, autoclaved or disinfected in a similar manner.

Air-water syringe tips should be removed and sterilized as other hand instruments.

(c) Reducing Aerosols

The use of rubber dams, high volume suction and patient positioning will reduce contact with blood and body fluids and reduce aerosols. Aerosols may be of concern in certain respiratory spread infections. Reducing aerosols also reduces environmental contamination with debris and particles of dental materials.

(d) Disinfection of Study Models, Impressions, and Appliances

Study models, impressions and appliances should be rinsed with water to reduce the organic debris after each use. It should then be placed in a disinfectant solution for ten (10) minutes and then rinsed again with water. If impression materials are well rinsed there is no significant effect on dimensional stability. Dimensional stability of zinc oxide and euginol, silicone rubber, and polysulfide impression materials is good after exposure to glutaraldehydes for up to sixteen (16) hours but significant change occurs with alginate and polyether materials.

Alginate and silicone rubber are stable with exposure to hypochlorite. All materials may be stable with the complex phenol solutions. Prostheses and appliances may be disinfected by soaking in a dilute chlorine solution.

(e) At the beginning of the day run the handpieces and air-water syringes to clear the lines of stagnant water. Run the handpiece between patients. Contaminated surfaces should be wiped with an accepted surface disinfectant such as sodium hypochlorite one in ten (10) dilution (alcohol is not accepted by the Council of Dental Therapeutics of the American Dental Association). At the end of a patient visit run a volume of water through the high volume suction; at the end of the day a 1:10 to 1:100 solution of household bleach should be run through the suction. All items to be disposed of should be placed in a plastic bag that is tied.

Brushes used to debride instruments should be placed in a disinfectant solution between uses.

The function of the chemiclave or autoclave should be verified at least every two - four weeks with appropriate testing devices (i.e. spot test strips or vials).

SPECIAL CARE FOR PSYCHIATRIC AND MENTALLY HANDICAPPED PATIENTS

In the setting of a psychiatric institution or one for mental disability the same precautions are necessary as those for the acute care hospital. Universal blood and bodyfluid precautions should be followed for all patients (see pages 3-6). However some special situations and circumstances need to be addressed.

1. Patients should be admitted for assessment, support and appropriate treatment of psychiatric and mental disorders irrespective of whether the patient is HIV antibody-positive, has AIDS, or an AIDS-related disorder.
2. Patients who are at high risk should be encouraged to be HIV antibody tested for both the patient's safety and the safety of other patients and staff.
   (a) The Attending Physician should advise the patient of the need for testing and should endeavour to elicit the patient's consent for testing.
   (b) If a high risk patient refuses consent no further action should be taken since all HIV testing requires the patient's consent.
3. The clinical record of patients with known HIV infection should state this clearly. No additional labelling should be done.
4. Patients with ARC/AIDS or HIV infection who are not sexually active or physically aggressive on the ward need not be isolated but should be nursed in a single room in order to reduce the risk of opportunistic infection.
5. HIV-positive patients who develop signs of an opportunistic infection should be transferred to an acute care medical unit in a general hospital for appropriate management.
6. If cardiopulmonary resuscitation is required for any patient, disposable ambu-bags and oral airways should be used when possible rather than mouth-to-mouth resuscitation.
7. Patients who are HIV positive may use common day rooms, lavatories and bathing facilities on the wards but shall be carefully instructed in personal hygiene.
8. Staff should make condoms easily available for any patient requesting them and to any patient who is likely to be sexually active on or off the hospital grounds.

HIV ANTIBODY TESTING AND COUNSELLING

HIV testing and counselling is available through:

1. **Physicians**

   Any registered physician in British Columbia can order the HIV antibody test. The blood should be sent to the provincial laboratory. As a general principle, testing should be accompanied by pre- and post-test counselling and education and by informed consent on the part of the patient.

2. **ATEC Clinic**
   828 West 10th Avenue
   Vancouver, B.C. V5Z 1L8
   (604) 660-6161

   Appointments can be made by telephone. Testing and counselling is performed by a specially trained nurse. Test results are available in two weeks.

3. **Health Units - Local**

   #1 East Kootenay Health Unit
   M.H.O.- Dr. A. G. Lowden
   Telephone - 426-1300 (Cranbrook)

   #2 Central Kootenay Health Unit
   Acting Director - Shirley Hunter-Oglow
   Telephone - 365-8525 (Castlegar)

   #4 North Okanagan Health Unit
   M.H.O. - Dr. A. Ross
   Telephone - 549-5700 (Vernon)

   #5 South Okanagan Health Unit
   M.H.O. - Dr. William Moorhead
   Telephone - 762-2704 (Kelowna)

   #6 South Central Health Unit
   Acting Director - Ms. H. Parkyn
   Telephone - 828-4411 (Kamloops)

   #7 Upper Fraser Valley Health Unit
   M.H.O. - Dr. M. L. Webb
   Telephone - 795-8200 (Chilliwack)

   #8 Central Fraser Valley Health Unit
   M.H.O. - Dr. R. Guasparini
   Telephone - 463-4184 (Maple Ridge)

   #9 Boundary Health Unit
   M.H.O. - Dr. W. G. Meekison
   Telephone - 594-0441 (Surrey)

   #10 Simon Fraser Health Unit
   M.H.O. - Dr. N. Arnott
   Telephone - 939-9261 (Coquitlam)

   #11 Coast Garibaldi Health Unit
   M.H.O. - Dr. Ray Marsh
   Telephone - 892-3585 (Squamish)

#12 Capital Regional District
Acting M.H.O. - Dr. Shaun Peck
Telephone - 388-4421 (Victoria)

#13 Central Vancouver Island Health Unit
M.H.O. - Dr. J. Millar
Telephone - 755-6200 (Nanaimo)

#14 Upper Island Health Unit
Acting Director - Joan Whitely
Telephone - 334-1140 (Courtenay)

#15 Cariboo Health Unit
Health Unit Manager - Ms. A. White
Telephone - 398-4600 (Williams Lake)

#16 Skeena Health Unit
M.H.O. - Dr. D. Bowering
Telephone - 638-3310 (Terrace)

#17 Peace River Health Unit
Health Unit Manager - Larry Austman
Telephone - 784-2400 (Dawson Creek)

#18 Northern Interior Health Unit
M.H.O. - Dr. B. Emerson
Telephone - 565-7311 (Prince George)

4. **Health Departments:**
   - Burnaby Health Department
     Director - Dr. S. Hemming
     Telephone 294-7260 (Burnaby)
   - North Shore Health Department
     Director - Dr. B. O'Connor
     Telephone - 988-5231 (North Vancouver)
   - Richmond Health Department
     Director - Dr. J. Garry
     Telephone - 276-4050 (Richmond)
   - Vancouver Health Department
     Director - Dr. John Blatherwick
     Telephone - 736-2033 (Vancouver)

AIDS REPORTING

All cases of AIDS must be promptly reported to the area medical health officer. HIV seropositivity is not reportable by physicians in British Columbia. However, laboratories permitted to perform HIV testing do report results to Public Health officials.

APPENDIX A

COMMUNITY RESOURCES

MINISTRY OF HEALTH - AIDS PROJECT

1) AIDS Information line			1-800-972-2437 872-6652
2) Resource Centre			660-6170
3) ATEC (AIDS Testing, Evaluation and Counselling) Clinic			660-6161
4) Outreach Offices	Main Street		685-4488
		Pager	735-4148
	Richards		660-6776
		Pager	735-4255
5) Local Health Unit/Department			Blue Pages

OTHER COMMUNITY RESOURCES

AIDS Vancouver	- General Information	687-5220
	- Hotline	687-2437
AIDS Vancouver Island		387-4554
Canadian Hemophilia Society		464-3437
Canadian Public Health Association		(613) 725-3769
Canadian Red Cross		879-7551
Federal Centre for AIDS		(613) 957-1772
Kinsmen Rehabilitation Foundation (Vancouver)		736-8841
Legal Aid of B.C.		687-1831
Ministry of Social Services and Housing		Blue Pages
St Paul's Hospital		682-2344
The Foundation for Immune Diseases		669-2396
Vancouver General Hospital & Dental Clinic		875-4006
Vancouver Persons with Aids Coalition (PWAs)		683-3381

SELECTED BIBLIOGRAPHY

1. CDC. Acquired immunodeficiency syndrome (AIDS): Precautions for health-care workers and allied professionals. MMWR 1983; 32:450-1.
2. CDC. Recommendations for prevention of HIV transmission in health-care settings. MMWR 1987; 36 (supplement #2S).
3. CDC. Update: Universal precautions for prevention of transmission of human immunodeficiency virus, hepatitis B virus, and other bloodborne pathogens in health-care settings. MMWR 1988; 37:377-88.
4. LCDC. Recommendations for prevention of HIV transmission in health-care settings. CDWR 1987; 13 (supplement #S3).
5. CDC. Recommendations for preventing transmission of infection with human T-lymphotropic virus type III/lymphadenopathy-associated virus in the workplace. MMWR 1985; 34:681-6, 691-5.
6. CDC. Recommendations for preventing transmission of infection with human T-lymphotropic virus type III/lymphadenopathy-associated virus during invasive procedures. MMWR 1986; 35:221-3.
7. CDC. Recommendations for providing dialysis treatment to patients infected with human T-lymphotropic virus type III/lymphadenopathy-associated virus infection. MMWR 1986; 35:376-8, 383.
8. Garner JS, Simmons BP. Guidelines for isolation precautions in hospitals. Infect Control 1983; 4(suppl):245-325.
9. McCray E. The Cooperative Needlestick Surveillance Group. Occupational risk of the acquired immunodeficiency syndrome among health-care workers. N. Engl J Med 1986; 314:1127-32.
10. Henderson DK, Saah AJ, Zak BJ, et al. Risk of nosocomial infection with human T-cell lymphotropic virus type III/lymphadenopathy-associated virus in a large cohort of intensively exposed health-care workers. Ann Intern Med 1986; 104:644-7.
11. Gerberding JL, Bryant-LeBlanc CE, Nelson K, et al. Risk of transmitting the human immunodeficiency virus, cytomegalovirus, and hepatitis B virus to health-care workers exposed to patients with AIDS and AIDS-related conditions. J. Infect Dis 1987; 156:1-8.
12. CDC. Update: Human immunodeficiency virus infections in health-care workers exposed to blood of infected patients. MMWR 1987; 36:285-9.
13. Baker JL, Kelen GD, Sivertson KT, Quinn TC. Unsuspected human immunodeficiency virus in critically ill emergency patients. JAMA 1987; 257:2609-11.
14. Martin LS, McDougal JS, Loskoski SL. Disinfection and inactivation of the human T-lymphotropic virus type III/lymphadenopathy-associated virus. J Infect Dis 1985; 152:400-3.
15. CDC. Public Health Service (PHS) guidelines for counselling and antibody testing to prevent HIV infection and AIDS. MMWR 1987; 36:509-15.

16. LCDC. AIDS: Guidelines for laboratories. CDWR 1986; 12:166-8.

17. Federal Centre for AIDS. National surveillance program on occupational exposure to HIV among health-care workers in Canada. CDWR 1987; 13:163-6.

18. Health and Welfare Canada. Infection control guidelines: Isolation and precaution techniques. Ottawa, Ontario: Health and Welfare Canada, 1985.

19. National Advisory Committee on AIDS. Acquired immunodeficiency syndrome (AIDS): Precautions for pathologists. CDWR 1986; 12:159-66.

20. Health and Welfare Canada. Infection control guidelines: Hospital environmental control. Ottawa, Ontario: Health and Welfare Canada, 1985.

21. Gallo RC. The AIDS virus. Scientific American 1987 (Jan);256:47-56.

22. Koop EC. Surgeon General's report on acquired immune deficiency syndrome. JAMA 1986;256:2784-9.

23. Laurence J. HIV infections in infants and children. Infect Med 1987 (Feb); 44-56.

24. AIDS Information for the Workplace. Province of B.C. 1988.

25. AIDS: A Perspective for Canadians; Report of the Royal Society of Canada, 1988.

26. CDC. Additional Recommendations to Reduce Sexual and Drug Abuse - Related Transmission of HIV-I virus. MMWR 1986; 35:152-55.

27. Favero MS. Sterilization, disinfection and antisepsis in the hospital. In: Manual of Clinical Microbiology, 4th ed. Washington, DC; American Society for Microbiology, 1985; 129-37.

28. Garner JS, Favero MS. Guideline for handwashing and hospital environmental control, 1985. Atlanta: Public Health Service, CDC,1985. HHS publication No. 99-1117.

29. Handsfield HH, Cummings J, Swenson PD. Prevalence of antibody to human immunodeficiency virus and hepatitis B antigen in blood samples submitted to a hospital laboratory - Implications for handling specimens. JAMA 1987; 258:3395-3397.

30. Lynch P, Jackson MM, Cummings MJ, Stamm W, et al. Rethinking the role of isolation practices in the prevention of nosocomial infectious. Ann Intern Med. 1987; 107:243-246.

31. Kane LMA, Lettau LA. Transmission of HBV from dental personnel to patients. J Am Dent Assoc 1985; 110:634-6.

32. Lettau LA, Smith JD, Williams D, et al. Transmission of Hepatitis B with resultant restriction of surgical practice. JAMA 1986; 255:934-7.

33. LCDC. Occupational exposure to HIV infection among health-care workers at the Toronto General Hospital. CDWR 1988; 14:141-146.